connection with the root. I bought the place on which the tree was, in 1885. The tree has borne and ripened oranges every year till 1890. In 1889 a sprout came up from the root. This proved to be a Chinese lemon on which the orange had been grafted. I was not here in 1889. When I arrived in the fall of 1890 I saw that shoots from the orange had been sent out the preceding spring but they had withered and died. The Chinese lemon was very thrifty and full of fruit. It evidently had taken the sap. The struggle was over and the orange was dead. I send you the whole of it with a part of the Chinese lemon shoot. I think it should be preserved, as it is proof positive of the circulation of sap through the heart-wood. It lived, blossomed and bore fruit every year for at least seven years, when there was no connection between the tree and the root, except the heart-wood."—W. WHITMAN BAILEY, *Brown University.*

Helianthus mollis.—Plants which I collected near Odin, Illinois, years ago, and plants from Tennesseee, sent by my friend, Dr. Gattinger, were blooming in my garden the past year. The Tennessee plants flower two weeks before the others, have involucral bracts double the length, and the leaves one-fourth broader, though no longer. The leaves of the Illinois plants are so thick that the nerves can scarcely be seen; the nerves of the other are strongly visible, and there are some other differences.

In these days variations of this character are scarcely worth special note. We find similar variations with any plant in areas of but a few acres in extent if carefully looked for.

In the Illinois plants I have noted that all the first flowers faced the southeast, the first day of opening. This season they all faced the northwest. I might settle the whole story by merely saying, "something in the environment must have influenced all these variations;" but to my mind the term "environment," so frequently used in connection with similar phenomena, is utterly meaningless. It is, however, clear that there are often separate lines of variation in widely separated localities. Sometimes I think we might solve the problem sooner if we were not so easily satisfied with the word "environment." THOMAS MEEHAN, *Germantown, Philadelphia.*

Further notes on the mutilation of flowers by insects.— In the GAZETTE for 1888, p. 39, I state that *Bombus pennsylvanicus* slits the corolla tube to obtain the nectar from *Physostegia Virginiana* and *Mertensia Virginica*. There was a mistake made in copying the name of the insect from the original notes; it should read *Xylocopa virginica*, the Virginia carpenter bee. Since the above mentioned note was pub-

lished I have repeatedly seen this bee visit these two species of plants, and in addition, the following: *Pentstemon pubescens*, *P. lævigatus*, *Pontederia cordata*, *Astragalus Canadensis*, and *Trifolium pratense*. It invariably, so far as my observation goes, slits the lower end of the corolla tube in order to reach the nectary. It is said to be the largest and most bulky of all known bees, the mouth parts being very highly organized. It appears to disdain to take its food in the usual slow fashion of other insects, but goes directly through the tissues to the nectary.

I have repeatedly observed the honey bee (*Apis mellifica* L.) visit all these plants, and it apparently prefers to take the nectar through the slits that have been made by the carpenter bee; but when it does not find a slit already made, it then goes to the mouth of the tube and visits the flower in the usual way, by entering at the mouth of the tube.

The common humble-bees are frequent visitors to all these, and many other flowers, but I have never seen them take the nectar in any other way than by the mouth of the corolla. *Bombus pennsylvanicus*, *B. americanorum* and *Apathus elatus* (the latter now thought to be the male of *B. americanorum*) are the only species which I have taken from flowers, and that have been certainly determined; but it is reasonable to conclude, from the strncture of their mouth-parts, that all the members of this genus take nectar in the same way.—JACOB SCHNECK, *Mt. Carmel, Ill.*

A new Ravenelia from Alabama.—In September, 1890, and during the autumn of 1891, the writer has collected at Auburn what proved to be an undescribed species of Ravenelia on *Cassia nictitans*. The species is remarkable for its great abundance on the stems and for the very long, fulvous pedicels of the teleutospores. It is characterized as follows:

Ravenelia Cassiæcola Atkinson, n. sp.—Caulicolous or hypophyllous. Sori on leaves one mm. or less, rotund or oblong; on stems oblong, irregular, confluent, sometimes covering space 1—10 cm. or more in length, frequently ambient, rupturing irregularly or longitudinally. Pseudo-peridium composed of closely cohering, irregularly angular, small cells, yellowish brown. Uredospores in mass appearing dirty yellowish white; singly, hyaline or dull yellow to fulvous, oval or rotund, minutely asperulate, 9–13×12–16 μ. Teleutospores in mass appearing black; singly, fulvous to dark brown; 30–100 μ, convex at free end, depressed where joined to pedicel, small ones rotund, composed of from 5–30 cuneate cells, their free ends frequently bearing a single hyaline, short spine; cells 18–23×20–30 μ; cystoid cells 5–15, rotund, hyaline or colored, rigid, 14–18 μ; pedicel fulvous, stout,